



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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PTC 2800 MAIL ROOM

In Re Application of :)
)
Heather Lea Stickler and)
Lisa Ann Caselli)
)
Serial No.: 09/736,615) Group Art Unit: 2827
)
Filed: December 14, 2000) Examiner: Jose H. Alcala
)
For: PRINTED CIRCUIT BOARD) Atty Dkt. 10007356-1
LAYOUT)

RESPONSE TO OFFICE ACTION MAILED AUGUST 26, 2002

To: Assistant Commissioner for Patents
Washington, D.C. 20231

This is in response to the Office Action mailed
August 26, 2002, in the above-referenced application.
Please amend the application as follows:

IN THE SPECIFICATION

Please amend the paragraph beginning at page 3, line 3 as
follows:

Applicants have discovered that by carefully
controlling the arrangement spacing and layering of
certain signal traces in an LVD SCSI bus that noise
problems affecting bus performance may be
significantly reduced. Techniques which may be
employed individually or collectively include
running RESET, SELECT and BUSY signal trace pairs in
adjacent relationship; providing increased
separation of RESET, SELECT and BUSY signal trace
pairs from the other bus signal traces; running at

least a portion of RESET, SELECT and/or BUSY signal trace pairs on a side of the associated PCSB opposite from the side where other bus signal traces are run.

Please amend the paragraph beginning on page 7, line 8 as follows:

The PCSB 10 comprises a board 12, Figs. 1 and 2, made up of multiple component layers which may each have electrical circuitry provided therein. The circuitry may be interconnected between layers by conductors, known as vias, which extend perpendicularly through the board. A typical PCSB in a personal computer may have 4 to 6 component layers. A typical PCSB in a computer work station or server may have 8 to 10 or more layers. Printed circuit board construction, as generally described immediately above, is well known in the art. The board 12 shown in the drawings comprises a first surface layer or "top" layer 14, a second surface layer or "bottom" layer 16 and a plurality of intermediate layers positioned between layers 14 and 16. (It is to be understood that the terms "top" and "bottom" are used herein because they are familiar reference terms which facilitate description of the preferred embodiments of the invention. However these terms are entirely arbitrary and are not to be construed in a manner which in any way limits the scope of the invention.) One of the intermediate layers may comprise a ground plane (not shown) constructed from a thin layer of copper or the like. The board has a peripheral portion 22 and a central

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portion 24. The peripheral portion 22 terminates at a plurality of interconnected, linear, peripheral edge portions 26, 28, 30, 32, 34, 36, 38, 40, 42, 44.

Please amend the paragraph beginning on page 7, line 8 as follows:

The second plurality of signal traces 144 may follow the same trace path 141 as the first plurality of signal traces 142. The difference, however, is that the second plurality of traces 144 extend along at least a portion of this path in the surface layer 14 opposite to the surface layer 16 in which the entire length of the first plurality of signal traces 142 is contained. This second set of signal traces 144 comprises fewer signal pairs than the first plurality of signal traces 142 and preferably includes at least the RESET signal pair 170, the SELECT signal pair 172, and the BUSY signal pair 174. The RESET, SELECT, and BUSY signal pair traces are preferably positioned next adjacent one another the entire length of the signal bus, i.e., no other bus signal traces are positioned between any two of the RESET, SELECT, and BUSY signal pairs.

IN THE CLAIMS

Please amend claim 1 as follows:

1. (once amended) A PCSB assembly comprising:
a PCSB;

a first plurality of LVD SCSI bus signal trace pairs formed in said PCSB; and

a second plurality of LVD SCSI bus signal trace pairs formed in said PCSB comprising a RESET signal trace pair, a SELECT signal trace pair and a BUSY signal trace pair and wherein said RESET signal trace pair, said SELECT signal trace pair and said BUSY signal trace pair are positioned next adjacent one another for the entire length thereof.

Please amend claim 5 as follows:

5. (once amended) The PCSB assembly of claim 1 wherein said PCSB comprises a first exterior surface layer and a second exterior surface layer opposite said first exterior surface layer and wherein said first plurality of LVD SCSI bus signal trace pairs are positioned in said first exterior surface layer and wherein said second plurality of LVD SCSI bus signal trace pairs are positioned at least partially in said second exterior surface layer.

Please amend claim 8 as follows:

8. (once amended) The PCSB assembly of claim 2 wherein said PCSB comprises a first exterior surface layer and a second exterior surface layer opposite said first exterior surface layer and wherein said first plurality of LVD SCSI bus signal trace pairs are positioned in said first exterior surface layer and wherein said second plurality of LVD SCSI bus signal trace pairs are positioned at least partially in said

second exterior surface layer.

Please amend claim 11 as follows:

11. (once amended) A PCSB comprising:
a first surface layer comprising a plurality of LVD SCSI bus signal trace pairs; and
a second surface layer opposite said first surface layer comprising at least a portion of at least one signal trace pair selected from the group of: a LVD SCSI bus RESET signal trace pair; a LVD SCSI bus SELECT signal trace pair and a LVD SCSI bus BUSY signal trace pair; and excluding all LVD SCSI bus signal trace pairs other than those in said group.

REMARKS

Claims 1-11 were pending in the application prior to this amendment. Claims 1, 5, 8 and 11 have been amended herein. Claims 2-4, 6, 7 and 9-10 remain in the application unchanged. Accordingly, after entry of this amendment, claims 1-11 will remain pending in the application. Reexamination and reconsideration are requested.

Attached hereto is a marked-up version of the changes made by the current amendment. The attached version is captioned **"Version with Markings to Show Changes Made"**.

I. Information Disclosure Statement

In paragraph 1 of the Office Action, the Examiner requires Applicants to submit new copies of the figures previously submitted with the IDS filed June 10, 2002.

In response to the Examiner's requirement and in order to ensure that the Examiner has access to all of the items previously submitted, Applicants enclose herewith copies of all of the documents previously submitted (including the figures). Specifically, copies of the following documents are filed herewith:

- Sun Microsystems Press Release dated May 5, 1998, entitled "Sun Slashes Prices, Boosts Performance Across Workstation Product Line" (3 pages)
- Declaration of Lisa Ann Caselli (1 page)
- Four annotated photographs referenced in paragraphs 7 and 8 of Ms. Caselli's declaration (4 pages)

Accordingly, the Examiner's requirement is believed to be addressed.

II. Legal Basis for Prior Art Rejections Applied in the Office Action

Legal Basis for Anticipation under 35 U.S.C. §102

The standard for lack of novelty, that is, for "anticipation," under 35 U.S.C. 102 is one of strict identity. To anticipate a claim for a patent, a single prior source must contain all its essential elements. Hybritech, Inc. v. Monoclonal Antibodies, Inc., 231 USPQ

81, 90 (Fed. Cir. 1986).

Legal Basis for Obviousness under 35 U.S.C. §103

The test for obviousness under 35 U.S.C. 103 is whether the claimed invention would have been obvious to those skilled in the art in light of the knowledge made available by the reference or references. In re Donovan, 184 USPQ 414, 420, n. 3 (CCPA 1975). It requires consideration of the entirety of the disclosures of the references. In re Rinehart, 189 USPQ 143, 146 (CCPA 1976). All limitations of the Claims must be considered. In re Boe, 184 USPQ 38, 40 (CCPA 1974). In making a determination as to obviousness, the references must be read without benefit of Applicants' teachings. In re Meng, 181 USPQ 94, 97 (CCPA 1974). In addition, the propriety of a Section 103 rejection is to be determined by whether the reference teachings appear to be sufficient for one of ordinary skill in the relevant art having the references before him to make the proposed substitution, combination, or other modifications. In re Lintner, 173 USPQ 560, 562 (CCPA 1972).

A basic mandate inherent in Section 103 is that a piecemeal reconstruction of prior art patents shall not be the basis for a holding of obviousness. It is impermissible within the framework of Section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. In re Kamm, 172 USPQ 298, 301-302 (CCPA 1972). Phrased somewhat differently, the fact that inventions of the references and of Applicants may be directed to concepts for solving the same problem does not serve as a

basis for arbitrarily choosing elements from references to attempt to fashion Applicants' claimed invention. In re Donovan, 184 USPQ 414, 420 (CCPA 1975). It is also clearly established in the case law that a change in the mode of operation of a device which renders that device inoperative for its stated utility as set forth in the cited reference renders the reference improper for use to support an obviousness-type rejection predicated on such a change. See, e.g. Diamond International Corp. v. Walterhoefer, 289 F.Supp. 550, 159 USPQ 452, 460-61 (D.Md. 1968); Ex parte Weber, 154 USPQ 491, 492 (Bd.App. 1967). In addition, any attempt to combine the teaching of one reference with that of another in such a manner as to render the invention of the first reference inoperative is not permissible. See, e.g., Ex parte Hartmann, 186 USPQ 366 (Bd.App. 1974); and Ex parte Sternau, 155 USPQ 733

In the case of In re Wright, 6 USPQ 2d 1959 (CAFC 1988), the CAFC decided that the Patent Office had improperly combined references which did not suggest the properties and results of the Applicants' invention nor suggest the claimed combination as a solution to the problem which Applicants' invention solved.

The CCPA reached this conclusion after an analysis of the prior case law, at p. 1961:

We repeat the mandate of 35 U.S.C. 103: it is the invention as a whole that must be considered in obviousness determinations. The invention as a whole embraces the structure, its properties, and the problem it solves. See, e.g., Cable Electric Products, Inc. v. Genmark, Inc., 770 F.2d 1015, 1025, 226 USPQ 881, 886 (Fed. Cir. 1985) ("In evaluating obviousness, the hypothetical person of ordinary skill in the pertinent art is presumed to have the 'ability to select and utilize knowledge from other arts reasonably pertinent to [the] particular problem' to which the invention is directed"), quoting In re Antle, 444 F.2d 1168,

1171-72, 170 USPQ 285, 287-88 (CCPA 1971); In re Antonie, 559 F.2d 618, 619, 195 USPQ 6, 8 (CCPA 1977) ("In delineating the invention as a whole, we look not only in the claim in question... but also to those properties of the subject matter which are inherent in the subject matter and are disclosed in the Specification") (emphasis in original).

The determination of whether a novel structure is or is not "obvious" requires cognizance of the properties of that structure and the problem which it solves, viewed in light of the teachings of the prior art. See, e.g., In re Rinehart, 531 F.2d 1048, 1054, 189 USPQ 143, 149 (CCPA 1976) (the particular problem facing the inventor must be considered in determining obviousness); see also Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co., 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984) (it is error to focus "solely on the product created, rather than on the obviousness or notoriousness of its creation") (quoting General Motors Corp. v. U.S. Int'l Trade Comm'n, 687 F.2d 476, 483, 215 USPQ 484, 489 (CCPA 1982), cert. denied, 459 U.S. 1105 (1983)).

Thus the question is whether what the inventor did would have been obvious to one of ordinary skill in the art attempting to solve the problem upon which the inventor was working. Rinehart, 531 F.2d at 1054, 189 USPQ at 149; see also In re Benno, 768 F.2d 1340, 1345, 226 USPQ 683, 687 (Fed. Cir. 1985) ("appellant's problem" and the prior art present different problems requiring different solutions").

A reference which teaches away from the Applicants' invention may not properly be used in framing a 35 U.S.C. 103 rejection of Applicants' claims. See United States v. Adams, 148 USPQ 429 (Sup. Ct. 1966).

III. Rejection of Claims 1, 5, 6 and 11 under 35 U.S.C.

§102(b)

Claims 1, 5, 6 and 11 stand rejected under 35 U.S.C. §102(b) as being anticipated by the article "Sun Slashes Prices, Boosts Performance Across Workstation Product Line" dated May 5, 1998, and the figures of the Sun Ultra

60 workstation. Reexamination and reconsideration are requested.

Claims 1, 5 and 6

Applicants' claim 1, as amended herein, recites the following:

A PCSB assembly comprising:
a PCSB;
a first plurality of LVD SCSI bus signal trace pairs formed in said PCSB; and
a second plurality of LVD SCSI bus signal trace pairs formed in said PCSB comprising a RESET signal trace pair, a SELECT signal trace pair and a BUSY signal trace pair and **wherein said RESET signal trace pair, said SELECT signal trace pair and said BUSY signal trace pair are positioned next adjacent one another for the entire length thereof.**

Claim 1 has been amended herein to more clearly recite that the RESET signal trace pair, the SELECT signal trace pair and the BUSY signal trace pair are positioned next adjacent one another as highlighted above. This amendment is clearly supported by Applicants' originally filed application with reference, for example, to page 11, line 29 - page 12, line 4 of the written specification, as originally filed, where the following is set forth:

The RESET, SELECT and BUSY signal pair traces are preferably positioned next adjacent one another the entire length of the signal bus. i.e. no other bus signal traces are positioned between any two of the RESET SELECT and BUSY signal pairs.

Referring to Fig. 4 of the Sun Ultra press release, it can be seen that, although a plurality of signal traces is disclosed, the RESET, SELECT and BUSY signal trace pairs are clearly not positioned next adjacent one another since other trace pairs are located between these pairs.

Accordingly, the Examiner's rejection of claim 1 is believed to be overcome. Claims 5 and 6 are believed to be allowable at least as depending from allowable base claim 1.

Claim 11

Applicants' claim 11, as amended herein, recites the following:

A PCSB comprising:

a first surface layer comprising a plurality of LVD SCSI bus signal trace pairs; and

a second surface layer opposite said first surface layer comprising at least a portion of at least one signal trace pair selected from the group of: a LVD SCSI bus RESET signal trace pair; a LVD SCSI bus SELECT signal trace pair and a LVD SCSI bus BUSY signal trace pair; and excluding all LVD SCSI bus signal trace pairs other than those in said group.

Claim 11, thus, recites a first PCSB surface layer comprising a plurality of signal trace pairs and an oppositely disposed second surface layer having at least one of a RESET, SELECT and BUSY signal trace pair. Claim 11 further recites that the second surface layer excludes all LVD SCSI signal trace pairs other than those in the RESET, SELECT, and BUSY group.

Referring now to Fig. 4 of the Sun Ultra press release, it can be seen that, although RESET, SELECT and BUSY signal trace pairs are formed on the surface shown, other trace pairs (e.g., ACK, ATN, REQ) are also formed on the surface. Accordingly, the surface layer shown in Fig. 4 does not exclude all LVD SCSI signal trace pairs other than those in the RESET, SELECT and BUSY group as required by claim 11.

For at least the reasons set forth above, claim 11 is not anticipated by the Sun Ultra press release.

IV. Rejection of Claims 2-4 and 7-10 under 35 U.S.C.

§103(a)

Claims 2-4 and 7-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the article "Sun Slashes Prices, Boosts Performance Across Workstation Product Line" dated May 5, 1998, and the figures of the Sun Ultra 60 workstation. Reexamination and reconsideration are requested.

Claims 2-4 and 7-10 are believed to be allowable as depending ultimately from allowable base claim 1. Claims 2-4 and 7-10 are believed to be further allowable on independent grounds for the reasons set forth below.

In paragraph 5 of the Office Action, the Examiner admits that the cited reference fails to disclose or

suggest all aspects of Applicants' claims 2-4 and 7-10. The Examiner takes the position, nevertheless, that the limitations embodied in these claims would be obvious.

Applicants' use of the limitations recited in claims 2-4 and 7-10 is not a matter within the knowledge of a person of ordinary skill in the art and the Examiner has submitted no evidence to the contrary. Accordingly, there is absolutely nothing in the file history of this prosecution to support the Examiner's rejection of these claims. There must be something in the teachings of cited references to suggest to an individual skilled in the art that a claimed invention would be obvious. *W. L. Gore and Associates v. Garlock, Inc.*, 220 USPQ 303, 311 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

"There must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from the Applicant's disclosure." *In re Dow Chemical Co.*, 5 USPQ2d 1529, 1532 (Fed. Cir. 1988).

For at least the reasons set forth above, the Examiner's rejection of claims 2-4 and 7-10 is improper.

V. Other Claim Amendments Not Discussed Elsewhere

Claims 5, 8 and 11 have been amended herein to correct minor typographical errors.

VI. Amendments to the Specification

The specification has been amended herein to correct various minor typographical errors.

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In view of the above, all of the claims are now
believed to be in condition for allowance. Re-
examination and reconsideration are requested.

Respectfully submitted,
KLAAS, LAW, O'MEARA & MALKIN, P.C.

By 

Michael A. Goodwin, Reg. No. 32,697
KLAAS, LAW, O'MEARA & MALKIN, P.C.
1999 Broadway, Suite 2225
Denver, CO 80202
Telephone: (303) 298-9888
Fax: (303) 297-2266
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